

What is claimed is:

1. A method for detecting or measuring the amount of oxidative stress or damage in a subject suspected of having Alzheimer's disease, comprising obtaining a sample from the subject, and detecting or measuring an amount of an oxidative stress marker in the sample.

2. The method of claim 1, wherein the sample is a neuron sample.

3. The method of claim 2, wherein the neuron sample is an olfactory neuron sample.

4. The method of claim 3, wherein the subject is human.

5. The method of claim 1 wherein the oxidative stress marker is carboxymethyllysine (CML), 4-hydroxy-2-nonenal (HNE), heme-oxygenase-I (HO-I), amyloid protein precursor, nitrotyrosine (NT), 8-hydroxyguanosine (8OHG), pentosidine, or pyrraline.

6. The method of claim 5, wherein the oxidative stress marker is carboxymethyllysine (CML), 4-hydroxy-2-nonenal (HNE), heme-oxygenase-I (HO-I), amyloid protein precursor, pentosidine, or pyrraline.

7. A method of screening for a candidate compound that modulates, inhibits, reduces, or prevents oxidative stress or damage comprising applying the candidate compound to a first olfactory neuron culture, detecting or measuring an oxidative stress marker in the first olfactory neuron culture to obtain a first amount, obtaining a second amount of the oxidative stress marker from a control olfactory neuron culture, and comparing the first amount to the second amount.

8. The method of claim 7, wherein the first olfactory neuron culture is under conditions of oxidative stress and the control olfactory neuron culture is not under conditions of oxidative stress.

9. The method of claim 7, wherein the first olfactory neuron culture is obtained from a subject suspected of having Alzheimer's disease and the control olfactory neuron culture is obtained from a subject not suspected of having Alzheimer's disease.

5 10. A method for diagnosing Alzheimer's disease in a subject comprising obtaining an olfactory neuron sample from the subject, measuring or detecting an amount of an oxidative stress marker in the sample, and comparing the amount with a control.

10 11. The method of claim 10, wherein the subject is diagnosed with Alzheimer's disease if the amount measured or detected is the same as the control where the control is an amount determined to be characteristic of subjects having Alzheimer's disease.

15 12. The method of claim 10, wherein the subject is diagnosed with Alzheimer's disease if the amount measured or detected is more than the control where the control is an amount determined to be characteristic of normal subjects not afflicted with Alzheimer's disease.

13. A method of treating a subject suspected of having Alzheimer's disease, comprising administering a compound determined to reduce, inhibit, or prevent oxidative stress by the method of claim 7 to the subject.

20 14. The method of claim 13, wherein the compound is administered in a therapeutically effective amount.

15. The method of claim 13, wherein the compound is administered as a suitable pharmaceutical formulation.

16. A method of modulating, reducing, inhibiting, or preventing oxidative damage in a subject comprising administering a compound determined to reduce, inhibit, or prevent oxidative stress by the method of claim 7 to the subject.

17. The method of claim 16, wherein the oxidative damage is neurodegeneration.

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